

# Tests for Malingering

## Identifying non organic hearing loss

February 6, 2012 · *Otology*

### Authors

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### Abstract

Malingering is common these days with liberal workmen compensation act. Lots of concessions are given to physically challenged these days. It is our duty to ensure that these incentives reach the deserving. In order to identify the beneficiaries we should weed out malingeringers. Fortunately there are various tests which can be performed to weed them out. This article is a treatise of how to identify malingeringers. It enumerates various bed side tests, tuning fork tests and objective tests to identify non organic hearing loss.

### Tests for Malingering

#### Definition:

Non organic hearing loss can be defined as an apparent hearing loss with no evidence of known disorder or insufficient evidence to explain it <sup>1</sup>.

It is of two types:

1. Psychogenic <sup>2</sup>
- <sup>2</sup> 2. Malingering

#### Psychogenic hearing loss:

This includes hearing loss associated with psychological conditions. The patient is not aware that he is simulating deafness. This is also known as conversion deafness.

#### Malingering:

Individual is consciously pretending to be deaf to avoid some responsibility / seeking concession even though his hearing may be absolutely normal. It occurs suddenly and disappears suddenly. It is often associated with mutism when bilateral.

**How to identify Malingering ?**<sup>3</sup> Quality of voice: Unlike in deaf persons the quality of voice is normal in malingeringers. Cochleoauricular / pupillary / palpebral reflexes are normally present in these patients. These reflexes cause twitching of pinna / contraction of palpebral muscles on exposure to loud noise. Malingering should always be suspected when there is a gross discrepancy between pure tone audiometry and speech audiometry. Lack of cross over (shadow effect) in pure tone audiometry should cause suspicion.

#### Tests for malingering:

##### Voice tests for Malingering:

### These are simple to perform.

**Erhardt's test:** This test is based on the principle even with a head shadow effect sound can easily be conducted through bone. This test helps in the detection of feigned total unilateral hearing loss. Occlusion of ear will cause attenuation of 30 dB. This test is performed with the patient's eyes closed. Sound is projected to the closed normal ear. Even with the head shadow effect patient should be able to hear the spoken word as external canal occlusion causes only about 30 dB dampening of sound. If the patient denies hearing spoken word then this test for malingering is positive.

**Lombard's test:** This test is based on "Lombard's principle". This principle says that one raises his / her voice when speaking in noisy environment. While performing this test, the patient is allowed to read a book. Noise is introduced into the ear. The noise is gradually increased till the patient raises his / her voice or stops the process of reading. If there is no change in voice loudness level the patient does not have functional hearing defect.

### Hummel Double conversation test:

When two different voices are applied to two ears it causes lots of confusion to the patient. If one ear is deaf then the patient is not confused by two different questions being projected to two ears since one ear is deaf, whereas in malingering the patient has normal hearing in both ears it causes lots of confusion. A malingerer wont respond.

**Delayed speech feed back test:** In this test the patient is subjected to spoken words whose output is delayed by 200 milliseconds. The level at which it caused difficulty in speaking is observed. This test is positive in malingerers.

### Two tube test of Teuber:

This is actually a modification of Hummel double conversation test. This test is performed using two tubes coupled with each other. Examiner holds one end of both tubes and starts speaking to it. By alternate compression of the tube he is able to confuse the malingerer to expose his designs.

**Stethoscope test:** In this test, one ear piece of the stethoscope is closed with wax and used on the side of deafness. The funnel shaped chest piece is used to talk to the patient. The malingerer gets confused and cannot tell whether he is hearing on the right / left side.

**Erhardt's test:** This test is also known as loud voice test. In normal person when the ear is occluded with a finger, it dampens the sound but it can still be heard. Malingerer often denies hearing the sound even when it is loudest.

**Doerffler Stewart test:** This test is based on the fact that persons with normal hearing raise their voice in the presence of background noise. This test can be performed in two ways: The patient is made to read a passage from a book, while masking noise is fed into the so called deaf ear. In the case of true deafness, the masking noise has no effect on the voice until it reaches the threshold of deafness. The patient may also be asked to listen to spoken voice instead of reading from a book.

### Tuning fork tests for malingering:

**Stenger's test:** This test is based on "Stenger's phenomenon". In stenger's phenomenon when a listener is presented with the same type of sound in both ears he /she will hear a single sound, that too only in the ear which it is louder.

**Procedure:** Two tuning forks with frequency of 512 Hz are kept equidistantly from both ears, one

should be able to hear equally well in either side. In malingering say i.e. left ear, even if the tuning fork is moved too close to the left ear, the patient denies that he is hearing in the right side also.

**Teal's test:** In this test a vibrating tuning fork is applied over the mastoid process of the so called deaf ear, the patient accepts to hear it. Then the patient is blindfolded and with a non vibrating fork on the mastoid process, the malingering patient claims to hear the sound.

**Chimani Mooss test:** This is nothing but a variation of Weber's test. Normally in Weber's test the patient hears the best in the occluded ear. In malingering the patient will not accept to hear better in the occluded ear.

#### Pure tone audiometry<sup>4</sup>:

While performing puretone audiometry the following features if present are suggestive of malingering:

**Variable response to stimuli:** During pure tone audiometry patients usually come out with uniform, repeatable response. In malingering this response is not uniform and highly variable.

Variations between clinically observable deafness and degree of pure tone audiometry hearing loss

**Air conduction shadow tests:** Maximum interaural attenuation for any frequency is about 85 dB, average attenuation across various frequencies would be 63 dB. Hence unmasked difference between two ears which exceeds 80 dB for any frequency or 70 dB over a range of frequencies is suggestive of non organic hearing loss

**Bone conduction shadow tests:** Maximal bone conduction transcranial hearing loss has been found to be less than 15 dB. A difference of unmasked bone conduction hearing threshold between both ears of more than 15 dB should point towards malingering.

**Stenger's test:** This test is based on Tarchanow phenomenon which states that when pure tones of equal intensities are presented bilaterally, they are fused into a single tone in the midline. A malingeringer is not aware of this and hence would report hearing loss / lateralisation of the stimuli.

**Auditory reflex threshold:** In normal individuals the stapedial reflex is elicited at 70 – 100 dB. If a malingeringer says he is totally deaf and if this reflex is elicited it is suggestive of malingering

**Bekesy audiometry:** This uses continuous and pulsed tone tracings. The normal graph recorded may be interleaved / continuous tracings below pulsed tone tracings. In patients with non organic hearing loss will have opposite curves – their pulsed tracings are tracked below the continuous tracings. This type of curve is known as Type V Bekesy pattern.

**Lengthened off time test:LOT:** Conventional Bekesy audiometry uses pulsed tones that are on and off for equal amounts of time (200 milliseconds on and 200 milliseconds off). The LOT is a test for non organic hearing loss that uses Bekesy audiometry in which the pulsed tones have an off time that is lengthened from 200 ms to 800 ms. In addition the LOT uses fixed frequency rather than sweep frequency tracings. In this test the continuous tracing is compared to the pulsed tracing that is obtained with a tone that pulses at a rate of 200 ms on and 800 ms off. The LOT increases the degree to which the pulsed tracing falls below the continuous tracing in malingeringers.

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